

REMARKS

The Office Action dated June 7, 2007 has been fully considered by the Applicant. By way of the present amendment, Claims 1, 4, and 5 have been amended and Claims 2 and 3 have been canceled.

I Oath/Declaration

The Examiner notes that the oath or declaration is defective and requests a new oath or declaration. A new declaration containing the statement suggested by the Examiner will be submitted upon allowance of the application.

II Specification

By way of present amendment, the Brief Description of the Drawings on Page 8 has been amended.

III 35 U.S.C. § 112

By way of present amendment, the lack of antecedent basis for “said drive rod string connectors” has been corrected and Claim 4 now particularly points out and distinctly claims the subject matter which the Applicant regards as the invention.

IV 35 U.S.C. § 103(a) Rejection of Claims 1-7

Applicant hereby responds to the Examiner’s rejection of Claims 1-7 as unpatentable over Kaiser in view of Hori et al. (Hori). By way of present amendment, Claims 1, 4, and 5 have been amended and Claims 2 and 3 have been canceled. As regards Claims 1-7, Applicant respectfully disagrees with the Examiner’s assessment that the present invention is obvious, based on the cited references being taken separately or in combination.

Regarding Claim 1:

The Examiner claims that Claim 1 is obvious in light of Kaiser in view of Hori. However, there is no suggestion in either Kaiser or Hori to combine any or all of the teachings of those patents to form the present invention. In fact, by the Examiner's own admission, Kaiser teaches away from the aspects of Hori included in the present invention. It is improper to combine references to achieve the invention under consideration unless there is some incentive or suggestion in the references to do so.

The Court of Appeals for the Federal Circuit has repeatedly held that under Section 103, teachings from various references can be combined only if there is some suggestion or incentive to do so. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F2d 1572, 221 USPQ 929 (CAFC 1984). Stated another way:

It is impermissible, however, simply to engage in a hindsight reconstruction of the claimed invention, using the applicant's structure as a template and selecting elements from references to fill the gaps...The references themselves must provide some teaching whereby the applicant's combination would have been obvious.

In re Gorman, 18 USPQ2d 1885 (CAFC 1991). The Examiner is required to follow the law as set forth by the Federal Circuit. The Examiner claims that the cited patents are combinable because they concern a similar technical difficulty. However, that does not mean that it would have been obvious to a person of ordinary skill to combine the teachings of these two patents, particularly when they not only do not contain any suggestion or incentive to combine, but one in fact teaches away from the aspects of the other that are included in the present invention. Therefore, while Kaiser teaches certain aspects of Claim 1 and Hori teaches certain other aspects of Claim 1, it would not have been obvious to combine these references to produce the invention of Claim 1.

Notwithstanding the foregoing, the Applicant currently amends Claim 1 to include elements not found in either Kaiser or Hori: the fact that the internal shoulder is spaced from the tip until the pin is elongated from stress and the fact that the shoulders on the pin and the shoulders on the connectors are roughened beyond inherent roughness to significantly increase the coefficient of friction between them. Therefore, even if it would have been obvious to combine Kaiser and Hori, the combination would not yield the invention in Claim 1.

The elements that have been added to Claim 1, and which are not found in either Kaiser or Hori, were previously contained in Claims 2 and 3, which are canceled by present amendment. The Examiner argues that both of these elements are obvious. However, the Applicant asserts that they are not obvious, for the following reasons.

Regarding the fact that the internal shoulder is spaced from the tip until the pin is elongated from stress, as previously found in Claim 2, the Examiner cites Hori at 2:10-18, 2:53-59, and 1:38-44 as teaching that the internal shoulder is spaced from the tip until the pin is elongated from stress, thus limiting stress in the thread portion and external shoulder and ultimately increasing the torque capacity. However, this is a mischaracterization of what Hori teaches.

Hori states at 2:10-18 that

the clearance at the internal shoulder is designed to be 0 to 0.5 mm when tightened firmly by hand. This allows the connection to withstand high torque and can effectively reduce tensile stress produced in the thread connection portion. If the clearance is above 0.5 mm, the internal shoulder may not contact properly, and the external shoulder may yield. The tool joint of the present invention effectively prevents such a problem.

Hori explains again at 2:56-59, “By designing the clearance at the internal shoulder 8 to be less than 0.5 mm (0 to 0.5 mm), the new tool joint is able to bear high torque and reduce tensile stress produced in the male thread 3 portion of the tubular body 1.” Thus, Hori addresses the problem in the prior art described at 1:38-44:

In the case of the aforementioned tool joints, the external shoulder and friction torque at the thread connection portion bear the torque. Thus, if excessive torque occurs at the bottom of a well during drilling, the external shoulder will yield, causing the tubular body 12 to expand in bell-shaped deformation, or resulting in breakage of the thread portion as pointed out in the Drilling Manual and other documents.

In other words, in the prior art, all of the torque was borne by the external shoulder and the thread connection portion. The addition of the internal shoulder allows some of the torque to be borne by the internal shoulder, allowing the tool to withstand increased torque. However, if the clearance between the internal shoulder and the tip is too great (greater than 0.5 mm), the internal shoulder and the tip cannot connect and the internal shoulder cannot shear in the burden of the torque. Therefore, Hori teaches that the clearance between the internal shoulder and the tip must be between 0 and 0.5 mm to allow increased torque capacity and stress on the thread connection portion and external shoulder. Hori does not require any space at all between the shoulder and the tip, but rather sets the maximum allowable limit for any space that may occur. Furthermore, Hori does not refer in any way to elongation of the pin due to stress.

On the other hand, the former Claim 2 of the present invention, now part of Claim 1, intentionally builds a space between the internal secondary stop and the frustoconical pin until the pin is elongated from stress. In the Detailed Description of the Preferred Embodiment, on page 14 at lines 1-10, it is noted that the threaded portion of the pin may elongate if the pin continues to rotate after being tightened onto the

connector. Therefore, the present invention includes an internal secondary stop to prevent further elongation in the event elongation occurs beyond a certain length.

The affirmative requirement of a space in the present invention is in marked contrast to the limitation on permitted space in Hori. In Hori, the purpose of the stop would be best served by allowing no space at all, and certainly no more space than 0.5mm. The present invention, on the other hand, requires space between the internal shoulder and the pin to accommodate elongation of the pin up to a certain length. It would not be obvious to a person of ordinary skill in the art to use the limitation on space between the shoulder and the pin from Hori to affirmatively require space to accommodate the elongation of the pin in the present invention.

Regarding the fact that the shoulders on the pin and the shoulders on the connectors are roughened beyond inherent roughness to significantly increase the coefficient of friction between them, as previously found in Claim 3, the Examiner notes that all real surfaces inherently have non-zero surface roughness, and therefore it is obvious that the shoulders have non-zero surface roughness and a corresponding non-zero coefficient of friction between them. The language explaining this element, as previously found in Claim 3 and now found in Claim 1, has been amended to clarify that the shoulders are not merely inherently rough, but are intentionally roughened to produce not just a non-zero coefficient of friction, but a significantly increased coefficient of friction. This structural difference is significant in that it provides not only for normal resistance of rotational movement, but for a significantly increased resistance of rotational movement and resultant increased transfer of torque, which is the present invention's fundamental purpose.

In summary, it would not have been obvious to combine Kaiser and Hori to produce the invention of Claim 1. Even if it were obvious to combine them, the combination would not yield Claim 1, as presently

amended. It would not be obvious in light of either Kaiser or Hori, or the combination of the two, to space the internal shoulder from the tip until the pin is elongated from stress or to roughen the shoulders on the pin and the shoulders on the connectors to significantly increase the coefficient of friction between them. Therefore, Claim 1 is not obvious.

Regarding Claim 2:

By way of present amendment, Claim 2 is canceled.

Regarding Claim 3:

By way of present amendment, Claim 3 is canceled.

Regarding Claim 4:

Claim 4 is dependent on Claim 1 and is believed allowable for the same reasons.

Regarding Claim 5:

As discussed in “Regarding Claim 1,” there is no suggestion to combine Kaiser and Hori, and therefore it would not have been obvious to do so to produce the invention of Claim 5. Furthermore, Claim 5 contains an element not included in either Kaiser or Hori: a roughened surface on the cylindrical shoulder of the pin. The Examiner asserts that the shoulder in Hori is intrinsically roughened as every real surface has non-zero roughness. However, as discussed above, the shoulder in Claim 5 is not merely inherently rough, but is intentionally roughened beyond normal or inherent roughness to produce not just a non-zero coefficient of friction, but a significantly increased coefficient of friction. Claim 5 is currently amended to better reflect this aspect of the invention. Given the fact that the shoulders are intentionally roughened, Claim 5 contains an element which is not found in either Kaiser or Hori. Therefore, even if there were

some suggestion to combine Kaiser and Hori, the invention of Claim 5 would not have been obvious to a person of ordinary skill in the art.

Regarding Claim 6:

Claim 6 is dependent on Claim 1 and is believed allowable for the same reasons.

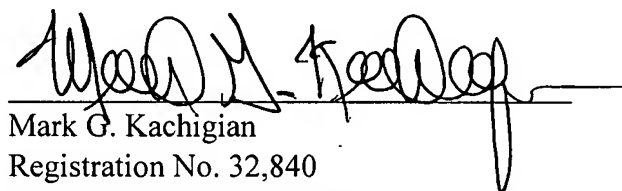
Regarding Claim 7:

As discussed in "Regarding Claim 1," there is no suggestion to combine Kaiser and Hori, and therefore it would not have been obvious to do so to produce the invention of Claim 7.

CONCLUSION

It is believed that the foregoing is fully responsive to the outstanding Office Action and that the application is now in condition for allowance, which is respectfully requested. If any issues remain, a telephone conference with the Examiner is requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Mark G. Kachigian', is written over a horizontal line.

Mark G. Kachigian
Registration No. 32,840
Head, Johnson & Kachigian
228 West 17th Place
Tulsa, Oklahoma 74119
(918) 587-2000
Attorneys for Applicant

Date: September 7, 2007